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BIOGRAPHICAL SKETCH

OF

MOSES G. FARMER.

[Extract from Chapter XXVII of The Telegraph in America and Morse Memorial.
By JAMES D. REID. In press.]

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THE NEW YORK AND BOSTON MAGNETIC TELEGRAPH COMPANY.

[Extract from Chapter XXVII of The Telegraph in America and Morse Memorial.
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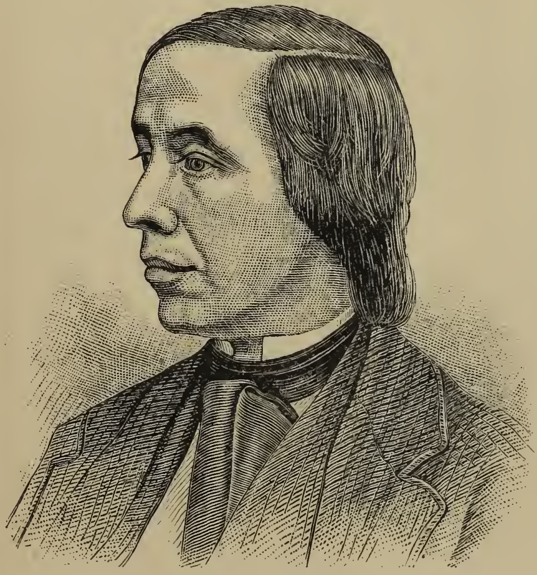
MOSES G. FARMER.

Among the men employed by "The New York and Boston Magnetic Telegraph Association," no more interesting character has appeared in the whole field of electrical enquiry than a man sent by Mr. Smith to open the office at Framingham, in December, 1847. This was Moses Gerrish Farmer, born February 9, 1820, at Boscawen, N. H., a graduate of Dartmouth College in 1844. As early as 1846, Mr. Farmer had invented an electro-magnetic engine, which, with a miniature railroad, he exhibited in connection with a lecture on electro-magnetism, in which, among other adaptations, he showed how the electric current could be used for torpedoes and sub-marine blasting.



Moses G. Farmer.

Mr. Farmer was first appointed by Mr. F. O. J. Smith to open the office in the depot at South Framingham, and to superintend line repairs between Boston, Worcester and Springfield, Mass. He had scarcely entered upon his duties

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at Framingham, before he tried the experiment of telegraphing by means of induced currents. At the request of Mr. Smith, he here also contrived and constructed models of apparatus for striking fire-alarm bells.

On account of conscientious scruples respecting Sunday work which his duties at Framingham required of him, Mr. Farmer, in July, 1848, took charge of the office at Salem, and of temporary repairs between Boston and Newburyport. Here he contrived an automatic circuit closer, which opened with the pressure of the hand while transmitting, and closed on its removal. He received an order also from Boston, for two machines to strike fire alarms, and which were made from the models previously prepared by Mr. Farmer for Mr. Smith by Howard & Davis, the celebrated clockmakers of Roxbury, Mass. One of these was placed in the office of Superintendent Sadler in Boston, and the other in connection with the Boston Court-house bell, both being united in a local circuit. In experimenting with this apparatus, the bell circuit was connected with that of the wire to New York, and the bell was rung by the New York operator.

Of course a fertile-minded man like this could not long be kept in Salem. This bell ringing resulted in his association, in 1851, with Dr. W. F. Channing, of Boston, who had, unknown to Mr. Farmer, been pursuing investigations in a like direction, and who had made a publication on the subject as early as 1845. Dr. Channing and Mr. Farmer now arranged a system of fire alarms, which they mutually perfected, under an appropriation of $10,000 by the Boston city government for that purpose. This resulted in Mr. Farmer's appointment as Superintendent of construction of the Boston Fire-alarm Telegraph, which was the pioneer of the system of fire-alarm telegraphs now so general in all the large cities of the country. In this system, Mr. Farmer, in connection with Dr. Channing, introduced the use of the closed in preference to the open signal circuit, and the automatic circuit wheel propellers instead of the finger key, for sending signals. The open circuit was afterward abandoned because of the defectiveness of insulation. The fire alarm was successfully demonstrated in Boston April 28, 1852, after two years of bitter opposition on the part of the firemen and many influential citizens.

In 1852, just before the New York and Boston Magnetic Telegraph Company ceased its independent existence, Mr. Farmer built a line for Prof. A. D. Bache, of the United States Coast Survey, connecting the Cambridge Observatory with the Boston office. Permission also was granted to Captain Charles Wilkes, United States Navy, to make use of the company's circuits in conducting experiments to determine the velocity of sound. To aid this, stations were provided at the Navy Yard, Boston, at the Watertown arsenal, at Salem, Cambridge, South Boston and at Fort Independence. Mr. Farmer constructed a chronograph specially for this purpose. Many experiments were made. The results were highly interesting, and attracted much public attention.

While these government experiments were going on, Mr. Farmer's brain was busy at other things. In 1852, he devised one or more closed circuit repeaters. He also commenced the construction of apparatus for the simultaneous transmission of four messages upon one wire. This was patented in 1853. In 1852, Mr. Farmer secured patents for his electro-magnetic bell-striking apparatus of 1848, his electric clock of 1849, and crowded the year with experiments on rheostats, voltameters, magnetometers, and galvanometers. The degree of A. M. was conferred on him in 1853, by the Faculty of Dartmouth College.

The fertility of Mr. Farmer's mind exhibited itself from this period in an almost endless variety of subjects. Connected with the telegraph were experiments on dial telegraphs and double or duplex transmission, which he claims to have explained to James Eddy and J. B. Stearns. About the same time he made experiments looking to the construction of apparatus to enable two reporters to send over one wire between Washington and New York, reports in short hand of congressional debates. In 1855, as a member of the American Association for the Advancement of Science, he read a paper on Multiplex Transmission, showing how it could be accomplished. In 1859, he produced the first undercut electrotype in this country, from a gutta percha mould. Also, about the same period, in connection with A. F. Woodman, he produced the well-known closed circuit repeater. In partnership with John M. Batchelder, he invented and patented the rubber insulator, sometimes referred to as Eddy's. In 1856, Mr. Farmer perfected the double transmitter, with reversed currents and constant resistance, and worked the double transmission system between Boston and Worcester, when two messages were sent simultaneously in opposite directions. This process was patented in 1858. He secured a second patent for double transmission in 1859. At this period also, he constructed a duplex printing telegraph, driven by an electro-magnetic motor. It contained the automatic unison stop, the continuously running train, and the detent for printing. The motion of the train was controlled by the centrifugal force of a fly-wheel.

In 1859 Mr. Farmer devoted much time to devising electro-magnetic apparatus to show the height of water in steam boilers; to an automatic regulator for controlling the distribution of electricity to numerous electric lamps; to the general subject of household illumination; to burglar alarms; alloys of aluminum with copper and other metals; the electrical deposition of nickel; electro-magnetic locks; the velocity of the blood; the dying of wool and the clarification of sugar. It was surely a busy life which crowded so much into its narrow limits.

During 1858–59–60, Mr. Farmer attempted to interest parties in the introduction of the duplex system of telegraphic transmission, but without success. It was not yet needed. He was more successful with an electric automatic regulator of light, for the means of perfecting which, and for valuable counsel, he was indebted to Messrs. Smith and Bates, of Boston. The attempt to operate such mechanism with thermo-electric batteries was a failure. After the most careful experiment only about one three-hundredth part of the fuel could be converted into electricity.

During 1865–66, Mr. Farmer, in conjunction with George F. Milliken, the well-known and able manager of the Boston office of the Western Union Telegraph Company, invented what is known as compound wire, for which two patents were secured. The core was of iron or steel, with a copper cover, so as to combine strength with lightness, and at the same time secure a diminished resistance. This led to the formation of the American Compound Telegraph Wire Company in 1868, the corporators of which were M. G. Farmer, George F. Milliken, Chester Snow and Alanson Cary. The first half-mile of wire produced by this company was formed by the electro deposition of copper upon a core of steel, in a vat containing some two or three hundred gallons of blue vitriol solution. The current was supplied from a thermo battery of 3744 pairs, arranged in 12 in series and 312 in multiple arc. The total internal resistance of this battery was 260 microms. Its total weight was about 1,500 pounds. It consumed 109 pounds of anthracite coal in 24 hours. The deposit of copper during the same time was about 12 pounds. A considerable quantity of this wire has been manufactured, but the demand for it has not as yet been extensive. In connection with the thermo-electric battery, Mr. Farmer claims to have been the first to construct a magneto-electric machine in which the field was maintained by the current derived from a thermo-electric battery.

In 1865–6, Mr. Farmer made another effort, in connection with W. H. Mendell, to introduce duplex telegraphy, which he successfully demonstrated upon a circuit of 300 miles, in Ohio. Nothing practical seems, however, to have resulted therefrom.

It is proper to say that the duplex method of Dr. Gintl was not, as first presented by that eminent electrician, practical. Mr. Farmer, uniting his own methods with Gintl's general plan, made it successful. It was worked with excellent practical results during 1858 and 1859, between Boston and Portland. Had the device been then needed, Farmer's duplex would have undoubtedly been properly valued and adopted. It may truthfully be said of Mr. Farmer, whose modesty is only equaled by his ability, that in invention he has been unfortunate in being almost always in advance of the necessities of the times. He thus became the feeder of others, while his own platter remained empty. If the facts were all known, it is believed that Mr. Farmer would be found entitled to priority in the invention of the mechanism by which automatic unison in the printing machinery is secured, and which forms so valuable a feature in much of that remarkable class of telegraphic mechanism.

One of Mr. Farmer's most successful experiments has been in the construction of permanent magnets. One of these, weighing only one pound, sustained, with its keeper, 39 pounds. Another, made from Firth & Sons' black diamond steel, and weighing only 10 ounces, sustained 28 pounds. These are but a portion of many interesting investigations in which Mr. Farmer has been engaged during the past 30 years, and which he still prosecutes with undiminished ardor.

Nothing has been said in this very condensed notice of one of the best and most unselfish of men of his love of music or the time devoted to it or instruction given in it. There is, indeed, something bird-like in the character of the man; pure, cheerful, full of hope and strong of wing. He is now engaged at the United States Torpedo station, at Newport, R. I., where he is developing, by careful experiment, new uses for the electric current in connection with the naval service of the United States Government.

Of the New York and Boston Magnetic Telegraph Company, little more has to be written. It fought the New York and New England Telegraph Company pertinaciously until the mutual war made the fighters desire peace. At last conferences were proposed. These ended in a consolidation of the two companies under a capital of $300,000, two-thirds of which was issued to the New York and Boston Magnetic Telegraph Company, and one-third to the New York and New England Telegraph Company. The companies thus united, re-organized under the name of the New York and New England Union Telegraph Company, July 1, 1852. The parties acting for the stockholders in accomplishing this union were, Francis O. J. Smith, Thomas M. Clark, John McKinney, John J. Haley, John McKesson, Abraham B. Sands.

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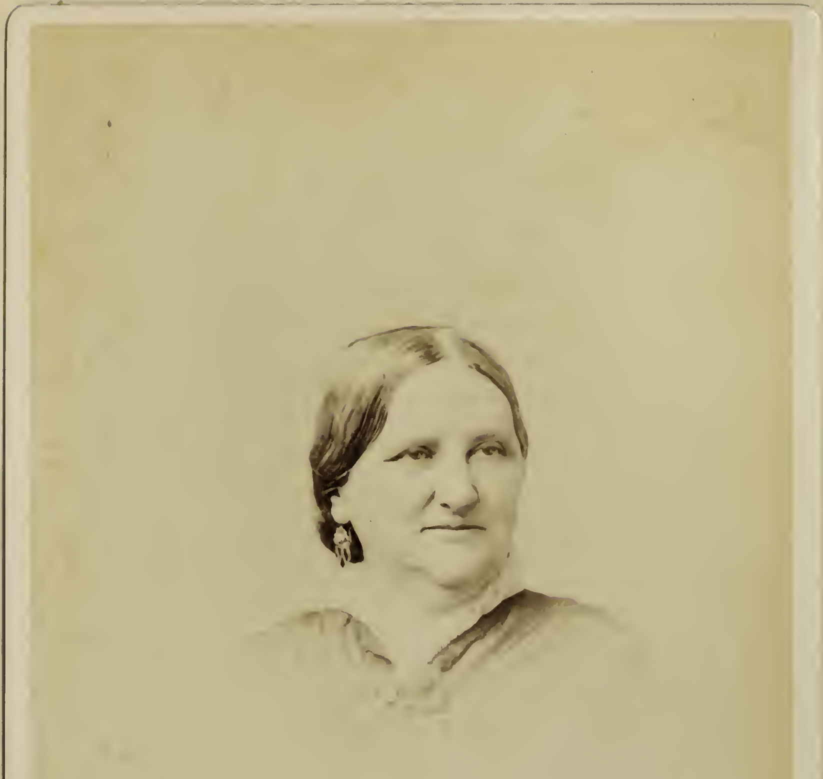

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